Remarks

Claims 1-98 were pending in the subject application. Claims 7, 18, 26, 56, 57, 60, and 62-95 have been withdrawn. By this Amendment, claim 98 has been amended. The undersigned avers that no new matter in introduced by this amendment. Entry and consideration of the amendments presented herein is respectfully requested. Accordingly, claims 1-6, 8-17, 19-25, 27-55, 58, 59, 61, and 96-98 are currently pending in the subject application.

It should be understood that the amendments presented herein have been made solely to expedite prosecution of the subject application to completion. These amendments should not be construed as an indication of Applicants' agreement with or acquiescence to, the rejections of record. Applicants expressly reserve the right to pursue the invention(s) disclosed in the subject application, including any subject matter canceled or not pursued during prosecution of the subject application, in a related application. Favorable consideration of the claims now presented, in view of the remarks and amendments set forth herein, is earnestly solicited.

Claim 98 has been amended to depend from claim 97 rather than claim 98.

Claims 1-6, 8, 19, 21, 22, 24, 30, 34, 37-40, 50-55, 58, 97, and 98 have been rejected under 35 USC §102(b) as anticipated by Webber (U.S. Patent No. 3,926,008). The applicants respectfully traverse this grounds for rejection. The Office Action, at page 2, states "Webber discloses a refrigeration system having a condenser and means 28 for flowing a first external fluid across the condenser wherein the fluid flow is parallel with the heat transfer surface of the condenser."

However, the Webber reference does not teach a means for flowing a first external fluid across the heat transfer surface of the condenser, wherein the flow of the first external fluid is substantially parallel with the heat transfer surface of the condenser, as claimed in claim 1 of the subject application. Instead, the condenser **22** of the Webber reference is a "conventional air-cooled condenser" (col. 1, lines 38-39). Although upon a cursory review of Figure 1 of the Webber reference it might appear that the fan **28** causes a first external fluid to flow from the right side to the left side of Figure 1, across the condenser parallel with the surface of the piping of the condenser **22**, the applicants assert this is not the case. Rather, Figure 1 of the Webber reference provides a schematic representation of condenser **22** and fan **28** for the cooling and heating system, not a three-dimensional representation. The applicants assert the air from fan **28** would flow into, or out of, the page with respect to Figure 1 of the Webber reference, therefore flowing perpendicular to the surface

of the piping of condenser 22. Specifically, as in conventional air-cooled condensers, the fan 28 would cause air to flow into, or out of, the page through the fins, represented by grate lines that are drawn perpendicular to the piping of condenser 22 in Figure 1 of the Webber reference.

The Office Action at page 4 states the "Applicant's assertion that the air from fan 28 would flow into or out of the page with respect to Fig. 1 and therefor perpendicular to the surface of the piping of condenser 22 is simply not supported by Webber's drawings. It is well settled that the references are interpreted for their plain common-sense meaning. The plain meaning of Fig. 1 of Webber is that the air flow is from right to left, from the fan 28 and parallel to the tubing of the condenser."

The Office Action then states that "Applicant would need to file an affidavit with factual evidence to support his allegations that the air flow is perpendicular to the tubing of the condenser."

Attached is an executed Declaration Under 37 CFR §1.132 by Daniel P. Rini, PhD. Referring to page 2, paragraphs 1 and 2 of Daniel P Rini's Declaration, Daniel P. Rini states,

> "The Webber reference does not teach a means for flowing a first external fluid across the heat transfer surface of the condenser, wherein the flow of the first external fluid is substantially parallel with the heat transfer surface of the condenser, as does the apparatus for cooling of the subject application. Instead, the condenser 22 of the Webber reference is a "conventional air-cooled condenser" (col. 1, lines 38-39). It is well known in the art that a conventional air cooled condenser functions by using a fan to force air across small tubes containing hot refrigerant such that heat is discharged into the ambient air.
>
> Although upon a cursory review of Figure 1 of the Webber reference it might appear that the fan 28 causes a first external fluid to flow from the right side to the left side of Figure 1, across the condenser parallel with the surface of the piping of the condenser 22, this is not the case. Rather, Figure 1 of the Webber reference provides a schematic representation of condenser 22 and fan 28 for the cooling and heating system, not a three-dimensional representation. The air from fan 28 would flow into, or out of, the page with respect to Figure 1 of the Webber reference, therefore flowing perpendicular to the surface of the piping of condenser 22. Specifically, as in conventional air-cooled condensers, the fan 28 would cause air to

flow into, or out of, the page through the fins, represented by grate lines that are drawn perpendicular to the piping of condenser **22** in Figure 1 of the Webber reference. Furthermore, one skilled in the art, having access to the Webber reference would understand from the schematic representation of condenser **22** and fan **28** of Figure 1 that the air from fan **28** would flow into, or out of, the page with respect to Figure 1 of the Webber reference, therefore flowing perpendicular to the surface of the piping condenser **22**.

In contrast, the subject apparatus as claimed in claim 1 incorporates a condenser having a heat transfer surface and a means for flowing a first external fluid across the heat transfer surface of the condenser, wherein the flow of the first external fluid is substantially parallel with the heat transfer surface of the condenser."

The applicants assert that the Declaration by Dr. Rini provides factual evidence to support the applicant's assertion that the air flow is perpendicular to the tubing of the condenser. Accordingly, the applicants assert that the Webber reference does not teach a means for flowing a first external fluid across the heat transfer surface of the condenser, wherein the flow of the first external fluid is substantially parallel with the heat transfer surface of the condenser, as claimed in claim 1 of the subject application.

With respect to claim 4, the Office Action states at page 4 that "Webber discloses the condenser as having a second surface on the inside of the coil. The condenser has a tubular shape, which is the shape of each individual pipe or line." However, the Webber reference does not teach an apparatus for cooling . . . wherein the condenser comprises a second surface . . . wherein the condenser has a substantially tubular shape having a first end and a second end, wherein the heat transfer surface is on the exterior side of the substantially tubular shaped condenser and the second surface is on the interior side of the substantially tubular shaped condenser, and wherein a volume is formed by the second surface of the substantially tubular shaped condenser, as claimed in claim 4. Rather, the Webber reference teaches piping. Although a pipe is a tubular shape, the pipe taught by the Webber reference does not have a second surface . . . wherein a volume is formed by the second surface of the substantially tubular shaped condenser, as claimed in claim 4. Instead of a volume as claimed in claim 4, the pipe taught by the Webber reference has an inner surface that contains

compressed refrigerant. Referring to page 2, paragraphs 3 of Daniel P Rini's Declaration, Daniel P. Rini states,

> "Furthermore, the subject apparatus for cooling as claimed in claim 4 incorporates the limitation "wherein the condenser comprises a second surface, wherein the second surface is substantially parallel to the heat transfer surface, wherein the condenser has a substantially tubular shape having a first end and a second end, wherein the heat transfer surface is on the exterior side of the substantially tubular shaped condenser and the second surface is on the interior side of the substantially tubular shaped condenser." The apparatus disclosed in the Webber reference does not meet this limitation. Rather, the apparatus disclosed in the Webber reference incorporates piping that carries the refrigerant. In contrast to the teaching of the Webber reference, the apparatus claimed in claim 4 of the subject application incorporates a condenser having a heat transfer surface and a second surface, wherein the second surface is substantially parallel to the heat transfer surface. With respect to the apparatus of claim 4, the condenser has a substantially tubular shape having a first end and a second end, wherein the heat transfer surface is on the exterior side of the substantially tubular shaped condenser and the second surface is on the interior side of the substantially tubular shaped condenser. In this way, the condenser is between the heat transfer surface and the second surface, inclusive. In fact, a volume is formed by the second surface of the substantially tubular shaped condenser, as claimed. The piping of the Webber condenser 22 has no such second surface."

Accordingly, the applicant asserts that the Webber reference does not teach an apparatus for cooling, wherein the condenser comprises a second surface, wherein the second surface is substantially parallel to the heat transfer surface, wherein the condenser has a substantially tubular shape having a first end and a second end, wherein the heat transfer surface is on the exterior side of the substantially tubular shaped condenser and the second surface is on the interior side of the substantially tubular shaped condenser, and wherein a volume is formed by the second surface of the substantially tubular shaped condenser, as claimed in claim 1 of the subject application.

Therefore, a proper §102 rejection has not been presented with respect to claims 1-6, 8, 19, 21, 22, 24, 30, 34, 37-40, 50-55, 58, 97, and 98. Accordingly, the applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1-6, 8, 19, 21, 22, 24, 30, 34, 37-40, 50-55, 58, 97, and 98 under 35 U.S.C. §102(b).

Claims 23, 25, 41-47, 59, and 61 have been rejected under 35 USC §103(a) as being unpatentable over Webber (U.S. Patent No. 3,926,008). The applicants respectfully traverse this grounds for rejection because the cited reference does not disclose or suggest the unique and advantageous apparatus claimed by the current applicants. The limitations of the Webber reference have been discussed above with respect to the rejection of claim 1 from which claims 23, 25, 41-47, 59, and 61 depend. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection of claims 23, 25, 41-47, 59, and 61 under 35 U.S.C. §103(a).

Claims 20 and 35 have been rejected under 35 USC §103(a) as being unpatentable over Webber (U.S. Patent No. 3,926,008) in view of Wang (U.S. Patent No. 5,950,445). The applicants respectfully traverse this grounds for rejection because the cited references, alone or in combination do not disclose or suggest the unique and advantageous apparatus claimed by the current applicants. The limitations of the Webber reference with respect to claim 1, from which claims 20 and 35 depend has been discussed above. The Wang reference does not cure this defect. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection of claims 20 and 35 under 35 U.S.C. §103(a).

Claims 48 and 49 have been rejected under 35 USC §103(a) as being unpatentable over Webber (U.S. Patent No. 3,926,008) in view of Reagen *et al.* (U.S. Patent No. 6,370,775). The applicants respectfully traverse this grounds for rejection because the cited references, alone or in combination do not disclose or suggest the unique and advantageous apparatus claimed by the current applicants. The limitations of the Webber reference with respect to claims 1, 37, 38, and 47 from which claims 48 and 49 depend has been discussed above. The Reagen *et al.* reference does not cure this defect. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection of claims 48 and 49 under 35 U.S.C. §103(a).

As the Examiner has not indicated an objection to the amended figures, applicants assume the amendments to Figures 2, 4, and 5 are accepted.

In view of the foregoing remarks and amendments to the claims, the applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 or 1.17 as required by this paper to Deposit Account 19-0065.

The applicants invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Applicant invites the Examiner to call the undersigned if clarification is needed on any aspect of this response, or if the Examiner believes there remains any valid ground upon which any claim in this application may be rejected subsequent to entrance of this amendment.

Respectfully submitted,

James S. Parker
Patent Attorney
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Fax No.: 352-372-5800
Address: P.O. Box 142950
Gainesville, FL 32614-2950

Attachments: Petition and Fee for Extension of Time Under 37 CFR §1.136(a)
Declaration Under 37 CFR §1.132

JSP/sjk/lkw

APPENDIX

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office on the date shown below:

May 17, 2005

James S. Parker, Patent Attorney

DECLARATION UNDER 37 CFR §1.132
Examining Group 3744
Patent Application
Docket No. RTI-101XC1
Serial No. 10/625,014

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner	:	William E. Tapolcai
Art Unit	:	3744
Applicant	:	Daniel P. Rini
Serial No.	:	10/625,014
Filed	:	July 22, 2003
Conf. No.	:	8426
For	:	Method an Apparatus for Highly Efficient Compact Vapor Compression Cooling

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF DANIEL P. RINI UNDER 37 CFR §1.132

Sir:

I, Daniel P. Rini, hereby declare:

THAT, my *curriculum vitae* is attached hereto as Exhibit A;

THAT, I am the inventor of the subject matter claimed in U.S. patent application 10/625,014 (hereinafter the '014 application);

THAT, I have read and understood the '014 application;

THAT, I have read and understood the rejection of claims in the Office Actions mailed January 19, 2005 and August 13, 2004, and the Election Requirement mailed May 20, 2004, in the '014 application;

AND, being thus duly qualified, do further declare:

1. The Webber reference does not teach a means for flowing a first external fluid across the heat transfer surface of the condenser, wherein the flow of the first external fluid is substantially parallel with the heat transfer surface of the condenser, as does the apparatus for cooling of the subject application. Instead, the condenser **22** of the Webber reference is a "conventional air-cooled condenser" (col. 1, lines 38-39). It is well known in the art that a conventional air cooled condenser functions by using a fan to force air across small tubes containing hot refrigerant such that heat is discharged into the ambient air.

2. Although upon a cursory review of Figure 1 of the Webber reference it might appear that the fan **28** causes a first external fluid to flow from the right side to the left side of Figure 1, across the condenser parallel with the surface of the piping of the condenser **22**, this is not the case. Rather, Figure 1 of the Webber reference provides a schematic representation of condenser **22** and fan **28** for the cooling and heating system, not a three-dimensional representation. The air from fan **28** would flow into, or out of, the page with respect to Figure 1 of the Webber reference, therefore flowing perpendicular to the surface of the piping of condenser **22**. Specifically, as in conventional air-cooled condensers, the fan **28** would cause air to flow into, or out of, the page through the fins, represented by grate lines that are drawn perpendicular to the piping of condenser **22** in Figure 1 of the Webber reference. Furthermore, one skilled in the art, having access to the Webber reference would understand from the schematic representation of condenser **22** and fan **28** of Figure 1 that the air from fan **28** would flow into, or out of, the page with respect to Figure 1 of the Webber reference, therefore flowing perpendicular to the surface of the piping condenser **22**.

In contrast, the subject apparatus as claimed in claim 1 incorporates a condenser having a heat transfer surface and a means for flowing a first external fluid across the heat transfer surface of the condenser, wherein the flow of the first external fluid is substantially parallel with the heat transfer surface of the condenser.

3. Furthermore, the subject apparatus for cooling as claimed in claim 4 incorporates the limitation "wherein the condenser comprises a second surface, wherein the second surface is

substantially parallel to the heat transfer surface, wherein the condenser has a substantially tubular shape having a first end and a second end, wherein the heat transfer surface is on the exterior side of the substantially tubular shaped condenser and the second surface is on the interior side of the substantially tubular shaped condenser." The apparatus disclosed in the Webber reference does not meet this limitation. Rather, the apparatus disclosed in the Webber reference incorporates piping that carries the refrigerant. In contrast to the teaching of the Webber reference, the apparatus claimed in claim 4 of the subject application incorporates a condenser having a heat transfer surface and a second surface, wherein the second surface is substantially parallel to the heat transfer surface. With respect to the apparatus of claim 4, the condenser has a substantially tubular shape having a first end and a second end, wherein the heat transfer surface is on the exterior side of the substantially tubular shaped condenser and the second surface is on the interior side of the substantially tubular shaped condenser. In this way, the condenser is between the heat transfer surface and the second surface, inclusive. In fact, a volume is formed by the second surface of the substantially tubular shaped condenser, as claimed. The piping of the Webber condenser 22 has no such second surface.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or of any patent issuing thereon.

Further declarant sayeth naught.

Signed: _____
Daniel P. Rini

Date: 5/17/05

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EXHIBIT A

Daniel P. Rini

B.S. Aerospace Engineering -- University of Central Florida, May 1995
M.S. Mechanical Engineering -- University of Central Florida, August 1997
Ph.D. Mechanical Engineering -- University of Central Florida, May 2000

President & CEO of Rini Technologies Inc., 2000 - present

Dr. Rini has been conducting research in the area of two-phase heat transfer including efforts to design, build and operate experiments involving high heat flux, low superheat pool boiling, evaporative spray cooling and forced convection flow. While in graduate school the Air Force Research Laboratory and the National Science Foundation supported his research work at the University of Central Florida. Dr. Rini is the founder and president of Rini Technologies, Inc., and has successfully completed several R&D contracts from the Department of Defense. RTI was founded to develop evaporative spray solutions for high power solid-state laser and power electronics. Under Dr. Rini's leadership RTI has demonstrated the first diode laser spray cooling system that will help enable high power solid state laser technology to the High Energy Laser (HEL) status. With these innovative technology demonstrations RTI is quickly becoming a lead thermal management innovator in the military high power solid-state laser community.

RTI is also emerging as a leading developer of miniature personal cooling systems. Based on RTI's patent pending miniature refrigeration technology, prototypes will soon be complete for the Army, DHS and NASA. These "water bottle size" cooling units will be used to keep soldiers, first responders and astronauts cool inside their protective suits when operating in hot environments.

1. Rini, Chow, Chen, "Bubble Behavior and Heat Transfer Mechanism in FC-72 Pool Boiling", Experimental Heat Transfer, Vol. 14, No.1, pg 27, 2001.
2. Rini, Chow, Chen, "Bubble Behavior and Nucleate Boiling Heat Transfer in Saturated FC-72 spray Cooling", Journal of Heat Transfer 2002.
3. Rini, "Spray Cooling of Diode Laser Arrays", Technical Digest, Solid State and Diode Laser Technology review, Albuquerque, June 2000 and May 2001.